

CLAIMS

1. A central or peripheral neural function-regulating agent comprising a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.

2. An antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy, comprising a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.

3. A central or peripheral neural function-regulating agent comprising a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide

4. An antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy, comprising a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide.

5. A diagnostic agent for central or peripheral neural function abnormalities comprising a polynucleotide containing a polynucleotide encoding a G

protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide.

6. A diagnostic agent for anxiety, insomnia, excitement, muscular atrophy, anesthesia sensitivity, convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia, palsy, ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea or sensory paralysis, comprising a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide.

7. A central or peripheral neural function-regulating agent comprising an antibody to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.

8. A preventive/therapeutic agent for ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis, comprising an antibody to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.

9. A central or peripheral neural function-regulating agent comprising a polynucleotide comprising a base sequence complementary to a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or a part of the base sequence.

10. A preventive/therapeutic agent for ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis, comprising a polynucleotide

comprising a base sequence complementary to a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or a part of the base sequence.

11. A method of screening a compound or its salt that changes the binding properties of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof to β -alanine or L-carnosine, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) β -alanine or L-carnosine.

12. A kit for screening a compound or its salt that changes the binding properties of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof to β -alanine or L-carnosine, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) β -alanine or L-carnosine.

13. A compound or its salt that changes the binding properties of β -alanine or L-carnosine to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, which is obtainable using the screening method according to claim 11 or the screening kit according to claim 12.

14. A method of screening an agonist or antagonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding properties of the receptor protein or a salt thereof to β -alanine or L-carnosine.

15. A kit for screening an agonist or antagonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding properties of the receptor protein or a salt thereof to β -alanine or L-carnosine.

16. A pharmaceutical comprising a compound or its salt that changes the

binding properties of β -alanine or L-carnosine to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

17. The pharmaceutical according to claim 16, which is a central or peripheral neural function-regulating agent.

18. A method of screening a compound or its salt that changes the binding properties of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof to β -alanine, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) β -alanine.

19. A kit for screening a compound or its salt that changes the binding properties of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof to β -alanine, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) β -alanine.

20. A compound or its salt that changes the binding properties of β -alanine to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, which is obtainable using the screening method according to claim 18 or the screening kit according to claim 19.

21. A method of screening an agonist or antagonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding properties of the receptor protein or a salt thereof to β -alanine.

22. A kit for screening an agonist or antagonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding properties of the receptor protein or a salt thereof to β -alanine.

23. A pharmaceutical comprising a compound or its salt that changes the binding properties of β -alanine to a G protein-coupled receptor protein containing the

same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

24. The pharmaceutical according to claim 16, which is a central or peripheral neural function-regulating agent.

25. An antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy, comprising an agonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

26. A preventive/therapeutic agent for ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis, comprising an antagonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

27. A method of screening a compound having an action of changing the expression level of a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4 to regulate the central or peripheral neural function, which comprises using a polynucleotide containing a polynucleotide encoding the G protein-coupled receptor protein or its partial peptide.

28. A kit for screening a compound having an action of changing the expression level of a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4 to regulate the central or peripheral neural function, comprising a polynucleotide containing a polynucleotide encoding the G protein-coupled receptor protein or its partial peptide.

29. A compound having an action of changing the expression level of a G protein-coupled receptor protein having the same or substantially the same amino

acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4 or its partial peptide to regulate the central or peripheral neural function, which is obtainable by using the screening method according to claim 27 or the screening kit according to claim 28.

30. A central or peripheral neural function-regulating agent comprising a compound which changes the expression level of a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4 or its partial peptide.

31. An antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy, comprising a compound or its salt that increases the expression level of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide.

32. A preventive/therapeutic agent for ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis, comprising a compound or its salt that decreases the expression level of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide.

33. A method of screening an agonist to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof, which comprises measuring the intracellular cAMP production suppressing activity when a test compound is brought in contact with a cell containing the receptor protein.

34. An agent for fortifying the signal transduction activity of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, comprising β -alanine or L-carnosine.

35. The agent according to claim 34, which is a central or peripheral neural function-regulating agent.

36. The agent according to claim 34, which is an antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy.

37. An agent for fortifying the signal transduction activity of a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, comprising β -alanine.

38. The agent according to claim 37, which is a central or peripheral neural function-regulating agent.

39. The agent according to claim 37, which is an antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy.

40. A method for antianxiety, hypnosis and sedation, muscle relaxation or anesthesia enhancement, or for the prevention/treatment of convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy, which comprises administering to a mammal an effective

dose of (1) a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof, (2) a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or (3) an agonist to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

41. A method of preventing/treating ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis, which comprises administering to a mammal an effective dose of (1) an antibody to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof, (2) a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or a part of the base sequence, or (3) an antagonist to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or a salt thereof.

42. Use of (1) a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof, (2) a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or (3) an agonist to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, to manufacture an antianxiety agent, a hypnotic sedative, a muscle relaxant, an anesthetic fortifier or a preventive/therapeutic agent for convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral

palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia or palsy.

43. Use of (1) an antibody to a G protein-coupled receptor protein containing the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof, (2) a polynucleotide comprising a base sequence complementary to a polynucleotide containing a polynucleotide encoding a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, or its partial peptide, or a part of the base sequence, or (3) an antagonist to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, to manufacture a preventive/therapeutic agent for ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea, dependence or sensory paralysis.

44. A diagnostic agent for central or peripheral neural function abnormalities comprising an antibody to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.

45. A diagnostic agent for anxiety, insomnia, excitement, muscular atrophy, anesthesia sensitivity, convulsion, dependence, schizophrenia, epilepsy, psychosomatic disorder, incontinence, neurogenic hypertension, threatened abortion, threatened premature delivery, male infertility, autonomic imbalance, cerebrovascular disorder, cerebral palsy (polio), spastic spinal paralysis, spinal vascular disorder, cervical spondylosis, ossification of posterior longitudinal ligament, multiple sclerosis, amyotrophic lateral sclerosis, spinocerebellar degeneration, traumatic sequelae, postoperative sequelae, pain, hyperesthesia, palsy, ataxia, paralysis, depression, delayed awakening, deficits in memory and learning, hypotension, dysuria, hypertrophy of bladder, dyspnea or sensory paralysis, comprising an antibody to a G protein-coupled receptor protein having the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 2 or SEQ ID NO: 4, its partial peptide, or a salt thereof.